

TOTAL QUALITY MANAGEMENT INTERVENTION FOR ENHANCING NURSING COMMITMENT AND PERFORMANCE IN JORDANIAN HOSPITAL: PROTOCOL OF A QUASI- EXPERIMENTAL STUDY

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ARTICLE INFO

Article History:

Received: 29 Sep 2018;

Received in revised form:

10 Oct 2018;

Accepted: 10 Oct 2018;

Published online: 10 Nov 2018.

Key words:

Total Quality Management,
Performance,
Commitment,
Continuous Quality
Improvement,
Nurses.

ABSTRACT

Background: Nurses play a significant role in the successful health care service delivery of any hospital, and their commitment and performance remain long standing determinants of quality service rendered for patients admitted to hospitals. Thus, enhancement of Nurses' commitment and performance cannot be overemphasized. **Objective:** The current research proposes to develop, implement, and evaluate the effect of Continuous Quality Improvement [CQI] aspect of TQM intervention in enhancing the commitment and performance of nurses in the government hospitals in Irbid, Jordan. **Methods:** Given the smallness of the target population and difficulty in randomizing by location and subject, the current study adopts a quasi-experimental time series research design. Two eligible hospitals are selected, and in the second quarter of 2018, the respondents comprising intervention and control groups will be sampled using stratified sampling technique. Pre- and post-intervention assessments will be conducted to test the hypotheses. One-way multivariate analysis of variance and two-way repeated multivariate analysis of variance will be used to analyze the data. **Results:** It is expected that there will be no difference between control and intervention group in respect of nurses' performance and commitment before intervention at baseline, but there will be a statistical significant difference between intervention and control group after intervention is expected to be the overall result of the current research. Likewise, it is expected that the level of commitment and performance among the intervention group and control group will be low and statistically non-significant ($P > .05$) before intervention, but after intervention, commitment and performance levels of the nurses in the intervention group will upsurge and statistically significant ($P < .05$), hoping that the intervention. will be effective to inculcate organizational behaviors in the nurses in the intervention group. **Conclusions:** While there can be a threat to the internal validity of the measures adopted for the research, this study contributes to the present body of knowledge, and it can equally be a useful guide for stakeholders and policy makers in Jordan and elsewhere.

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Cite this article as: Alzoubi, Majdi M., Hayati, K. S., Rosliza, A. M., Ahmad, A. A., & Al-Hamdan, Z. M., "Total Quality Management Intervention for Enhancing Nursing Commitment and Performance in Jordanian Hospital: Protocol of a Quasi-Experimental Study". *International Journal of Advanced Scientific Research & Development (IJASRD)*, 05 (10/I), 2018, pp. 01 – 12. <https://doi.org/10.26836/ijasrd/2018/v5/i10/51001>.

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INTRODUCTION

Sound health constitutes a significant aspect of living standard of any country. In both developed and developing countries, guaranteeing the healthy living of people, the safety of patients and personnel and improving quality have become significant objectives for national health systems. In order to achieve this objective, hospitals are built, and health employees are saddled with the responsibility of tackling any health challenge that may arise (Øvretveit, 2003). However, due to the competitive and dynamic environment within which hospitals operate, health care delivery service becomes more challenging and reaches a defying and complex level for suppliers, leaderships and employees (Medici, 2011).

Furthermore, health organizations in the present time are confronted with a myriad of challenges bordering on increases in the cost of health services, rapidly growing technology dependence, pressure on health organizations to decrease costs and improve quality (Aiken et al., 2012), and satisfying patients' needs (Chang, Chen, & Lan, 2013). These have all been the major challenges that require maintenance of high quality services (Chang, Chen, & Lan, 2013). In Jordan, shortage of nurses and caregivers threatens the quality of health care provided for consumers, as nurses continue to leave their jobs. Nurses' turnover could be linked to lack of commitment because, as posited by van Dyk and Coetzee (2012) and Yücel (2012), organizational commitment is a significant driver of employee turnover intention in numerous sectors.

Nurses play a significant role in the successful health care service delivery of any hospital. They represent a larger part of health care organizations (Al-Shdaifat, 2015). The challenges confronting the hospitals today are traceable to three factors comprising lack of nurses' commitment, performance, and continuous quality improvement (CQI). Despite the importance of nurses in the hospital setting, and the problems confronting hospitals, especially in Jordan, research on nurses' commitment, performance and CQI attracts little attention of researchers (Mrayyan & Al-Faouri, 2008).

Enhancing commitment of nurses is paramount to the accomplishment of overall performance of the hospitals and effective health care system (Awases, Bezuidenhout & Roos, 2013). Jafaraghaee, Mehrdad, and Parvizy (2014) posit that lack of nurses' commitment in hospitals will jeopardize day-to-day health care service delivery in the hospitals. Commitment has connection with performance, as committed nurse will engage themselves in more in extra-role behaviors such as creativeness or innovativeness.

Furthermore, nurse performance remains long standing determinant of quality service rendered for patients admitted to hospitals. However, there is paucity of information on nurses' performance level in Jordan as indicated by the survey of existing literature on the subject matter. It has been signified that workers' crisis in hospitals and work overload are some of the main causes of burnout and low performance in the hospitals (Manzano-García & Ayala, 2017). Experiencing violence and dealing with others' pain and disease constitute a continuous stress for nurses. This serves as a major bane affecting the performance of nurses in most of the hospitals in Jordan. Thus, there is need for serious research attention to address the issue in context of Jordan.

There is a general belief, supported by growing research literature, that there are effective methods to improve the current scenarios in the hospitals (Øvretveit, 2003).

Needleman, J., & Hassmiller, S. (2009) posit that the commitment and the performance of nurses can be enhanced with the aid of intervention program (e.g. continuous quality improvement [CQI]/total quality management [TQM] intervention). They stated that research should continue to focus on factors that can enhance nurses' commitment towards their work as an attempt to improve quality of care and control escalating costs, because understanding the factors that predict the nurses' commitment towards their work is paramount for developing quality healthcare service, and such factors should be focused on and incorporated as part of organizational intervention strategies. They also argued that nurses are part of the most important resources of health systems. The performance of a health organization depends on the knowledge, skills and motivation of individual employees. It is therefore important for employers to provide suitable intervention program that will guarantee that the performances of nurses meet the desired standards.

Although research on nurse commitment and performance is scanty in the developing countries (Omran & Obeidat, 2015), the review of literature has signified that TQM is a significant determinant of nurses' commitment and performance. Many researchers have studied TQM and its relationship with nurse performance and commitment among nursing services. However, very few studies have addressed certain TQM principles, particularly its CQI aspect, in relation to nurse performance and nurse commitment, because TQM is known for continuous quality improvement (Sallis, 2014), quality improvement, quality management, and total quality control (McClellan, & Rivlin, 2014). In the medical parlance, TQM aims at embedding orientation of quality in all processes and procedures in the delivery of health services, and it is generally believed that the higher the level of TQM implementation the higher the level of nurse performance and commitment to the tasks assigned (El-Tohamy & Al Raoush, 2015).

Moreover, the findings of the extant literature regarding the effect of TQM on performance are inconclusive (Al-Dhaafri, Yusoff, & Al Swidi, 2014). Also, there are few studies that analyze the causal link between TQM and performance (Corredor & Goni, 2010). Some of these studies (e.g. Zehir, Ertosunb, Zehir, & Muceldilli, 2012) found that TQM has a significant and positive relationship with organizational performance. On the other hand, some other studies found that there is no significant relationship between TQM and performance, but some studies indicate that TQM can affect the performance negatively. Thus, this indicates that the findings of the extant studies inconsistent (Sadikoglu & Olcay, 2014; Kober, Subraamanniam, & Watson, 2012).

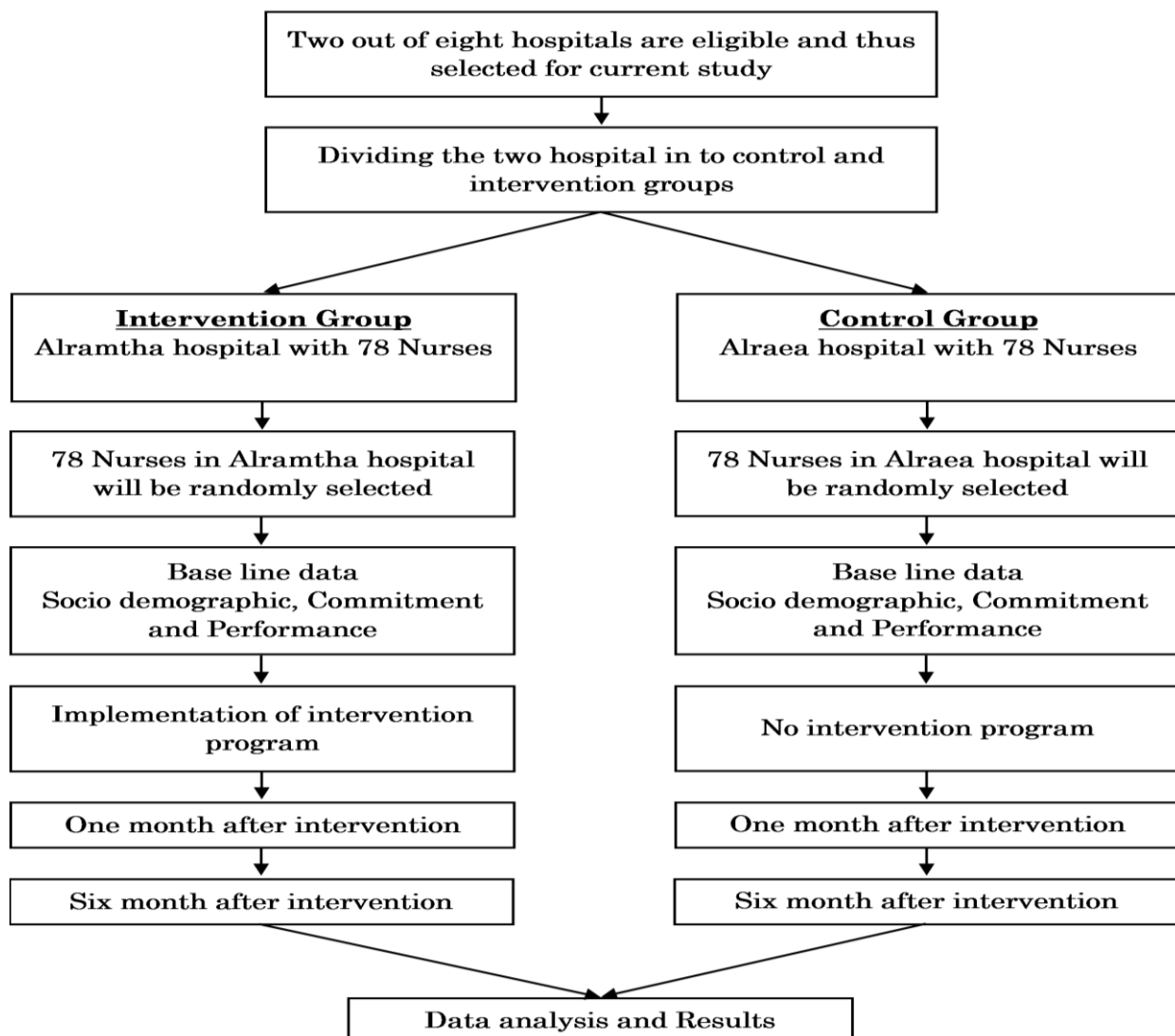
Despite that CQI, an aspect of TQM and as an intervention, is capable of coping with all of the challenges confronting hospitals and resolve all health organization's problems (Cummings, & Worley, 2014), it is a new phenomenon in Jordan, most of the studies on CQI/TQM are theoretical, descriptive, and speculative in nature (Al-Marri, Ahmed, & Zairi, 2007).

Given the above explication, this study proposes to develop, implement, and evaluate the effect of CQI aspect of TQM intervention in enhancing the commitment and performance of nurses in the government hospitals in Irbid, Jordan. To the best of the researchers' knowledge, this study might be the first intervention study to introduce and design CQI/TQM program as an intervention for enhancing nurse commitment and performance in the Jordanian health care system.

METHOD

Given the smallness of the target population and difficulty in randomizing by location and subject, the current study adopts a quasi-experimental time series research design (Moore, 2008). This research design has been adopted by other researchers (e.g. Silva, Marques, Nascimento, & Marques, 2013; Hofmann, Rosanowsky, Jensen, & Wah, 2015) to be suitable for the intervention study. Only two out of eight hospitals are eligible and thus selected for current study, since they are slightly similar in bed capacity and human resources.

Figure – 1: Study Flow



The selected hospitals are Alramtha and Alraya. The respondents (*i.e.*, nurses) in Alramtha hospital will be selected as intervention group while those of Alraya hospital will be considered a control group. Within first quarter of 2018, data on nurses' socio demographic information, years of experience, level of qualification, and type of the wards they belong to will be collected at baseline in both control and intervention groups. Then, there will be simultaneous preintervention assessment in which the commitment and performance of both groups will be measured through the pre-tested questionnaire.

Following the preintervention assessment, the intervention will be implemented to the intervention group, but the control group will remain without intervention. Moreover, after one month of intervention, the questionnaire will be distributed among nurses in both groups to measure the immediate effect of intervention. Six months later, the same procedure will be repeated, with the intention to examine the differences and/or similarity between intervention group and control group, and to examine the effect of the intervention program on the intervention group. The processes involved in conducting the study are reflected in Figure 1.

2.1 Sample Size

To maintain rigour in data analysis, avoid type II error, and enhance power analysis, an effective sample size should be calculated (Hallberg, 2008). Estimation of sample size is crucial in research, as it would ensure that all findings have external validity. In estimating sample size, method of power analysis was adopted, given that Cohen (1992) posited that method of power analysis is based on small, medium and large effect sizes and produced nomograms for the estimation of sample size for a range of statistical tests. To establish a medium effect size, at a conventional power of 0.80 and probability of 0.05.

This size encompasses the required size need for conducting a correlation coefficient aiming to establish a medium effect size at a conventional power of 0.80 and significant level of 0.05, which, as illustrated by Cohen (1992), requires an overall sample of 78 participants. However, the total number of nurses who actually enrolled in the study survey are 156 participants.

The sample size in the current study was estimated using the following formula:

$$n = \frac{2\delta^2[Z1 - \alpha/2 + Z1 - \beta]^2}{(\mu_1 - \mu_2)^2} \text{ (For continuous variables e. g., job performance (Bellé, 2013))}$$

Where: (a) using an assumed expected outcome of performance score increase within 6 months of intervention is at least

δ_1 = estimated standard deviation (assumed to be equal for each group) is 0.38.

μ_1 = estimated mean performance score after intervention is 3.78.

μ_2 = estimated mean performance score for control group is 3.56.

δ_2 = estimated standard deviation (assumed to be equal for each group) is .80

$Z1-\alpha/2$ = standard error when $\alpha = 0.05$ (95% Confidence Interval) = 1.96

$Z1-\beta$ = standard error associated with power = 1.28 ($\beta = 0.20$)

Power ($1-\beta$) = 80%

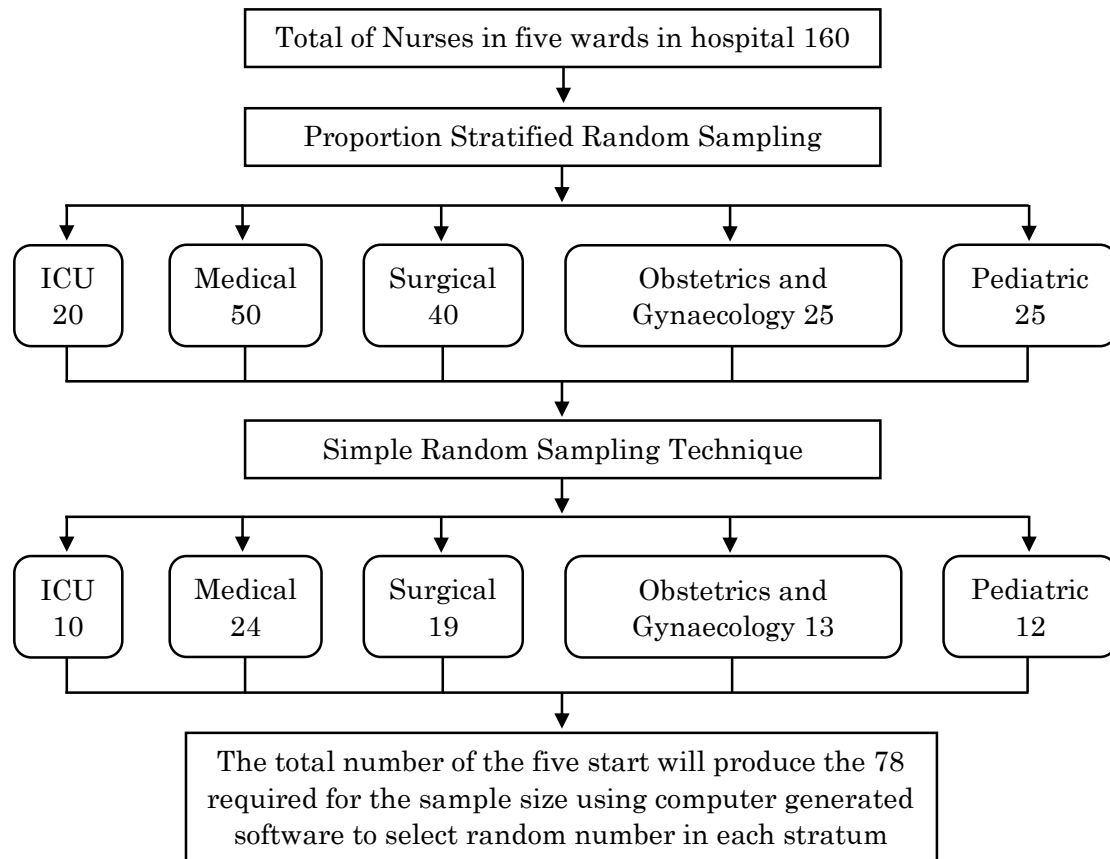
Based on the above formula, the required minimum sample size for each group, n is 66. To factor in 20% attrition (20), total required per group will be 78; hence, a total of 156 nurses were required for the sample in both groups from previous studies.

2.2 Sampling Technique

With regards to the selection criteria, the registered nurse (RNs), who work in surgical, medical ward, intensive care unit, and orthopedic wards will be included. The other inclusion criteria adopted in selected the respondents involves mode of work, level of education, years of working experience and intention to stay. Thus, the nurses who provide

direct care to the patient, have at least 3 years of diploma in nursing, have at least 6 months of experience in the current workplace, and have no plans of leaving the hospital within the next coming 6 months will be included in the selection.

Figure – 2: Sampling Technique



However, nurse-clerks and licensed practice nurses (LPNs) will be excluded. In addition, the method to be employed to sample nurses would be proportionate stratified random sampling, in which the required sample of nurses will be selected to represent the five wards included in each hospital comprising ICU, surgical and medical and Obstetrics and Gynaecology and paediatric, depending on the number of nurses in each ward. The sampling frame will be derived from the list of nurses obtained from nursing offices of the included wards (emergency and ICU, surgical and medical and Obstetrics and Gynaecology and pediatric), which have direct patient care. Then, inclusion and exclusion criteria will be applied to nurses derived from the list.

Afterwards, five strata will be created in both hospitals. In each stratum, the nurses will be selected using simple random sampling technique. The total number of the five strata will produce 78 nurses required for the sample size. Software number generator will be used to select random number of nurses in each stratum, and then there will be employment of matched random assignment, which can match strata or subject on certain characteristic between intervention and control group, taking the education level and type of ward as covariates to match between the intervention and control groups or employing the pairwise matching method which can identify any pair of participants who are matching in other aspects or trying to achieve the similar groups that match each other in regards of

the variables that are deemed important in the study. The last two matching methods are crucial to control the confounding variables. This description is contained in Figure 2.

- Number of strata: 5 strata
- proposed method for comparison: Analysis of variance (ANOVA)
- Sample size according to these parameters is: 10-24 participants in each group, so the total number of participants in the survey is 78 (Cohen 1992).

2.3 Instruments

This study will make use of questionnaire as a tool of gathering information from the respondents. A questionnaire is a pre-formulated and written set of questions to which respondents record their answers, usually within rather closely defined alternatives (Sekaran, 2003). The questionnaire for this study comprises three sections. The first section deals with socio demographic data, level of education, and number of years in service. Nominal or categorical level of measurement will be applied for the items in this section. The second section contains the information regarding nurses' performance comprising 46 items measured on a 5-point Likert scale. The third section deals with professional commitment of the respondent. This contains four items measured on a 5-scale. Nurses are expected to spend 7 minutes completing the questionnaire.

The instruments or measures adopted in this study have been used and validated by the previous studies. For example, the instruments for commitment was used earlier by Lachman and Aranya (1986) and Teng *et al.*, (2009). Both studies found the instrument to be valid and reliable. Likewise, the instruments for the job performance have been used earlier by Schwirian (1978) and found to be valid and reliable. Notwithstanding, to achieve accurate and precise results, the validity and readability of the questionnaire will be evaluated. Face validity will be done, as the draft of the questionnaire will be examined by an expert and three lecturers in the Universiti of Putra Malaysia and Jordan University of Science and Technology, as this would guarantee the veracity of the meaning, wording, and sequences, clarity, representation, and comprehensiveness.

Furthermore, explanatory factor analysis will be conducted to ensure structural correlation between variables and factors on the instruments. Finally, reliability through the Cronbach coefficient alpha will be conducted to ensure internal consistency.

2.4 Intervention

The intervention to be employed in this study will be piloted before implementation. It will be delivered as educational lectures for the nurses in the selected departments of the intervention hospitals. The materials are based on the module developed for the purpose of the study. The intervention module was developed from previous studies and based on 5S and KAIZEN aspects of TQM, where KAIZEN simply mean Continuous Quality Improvement (CQI). The term "5S" refers to an acronym of five Japanese terms that all start with S. These comprise Seiri; Seiton; Seisou; Seiketsu; and Shitsuke, which mean Sort, Set, Shine, Standardize, and Sustain respectively in English language (Ishijima *et al.*, 2016; 2014).

The intervention consists of six sections, discuss how the 5S approach can be tailored towards the actualization of the TQM, and how to it can used to enhance nurses' commitment and performance. The first section focusses on SORT, in the context of 5S,

which touches on the importance of separating essential items, materials, and tools that are needed at the work venue from the unnecessary ones and hold on to only those ones that are needed. The second section concentrates on SET, which centres on efficiency through the arrangement of the sorted items, materials, and tool in such a way that promotes flow of work.

Furthermore, section three to five delve on SHINE, which emphasizes making the workplace clean and neat; STANDARDIZE, which advocates consistency of the work practice in the standardized fashion; and SUSTAIN, which calls for making compliance with all the earlier 4S in an automatic habit. The sixth section discusses KAIZEN, which means “change for the better” or “improvement” is a Japanese word that focuses on the philosophy of improvement in activities (URT-MoHSW, 2013). KAIZEN is a process of CQI by means of a non-stop process to uplift the standard of the work environment and services contents to the best condition and maintain it as user-friendly and convenient as possible (URT-MoHSW, 2013). In the hospital context, the focus of KAIZEN is the output of the hospital in terms of improvement in working process such productivity, quality, service delivery, safety, moral of staff, and cost control.

With regards to manning of the intervention module, the lecture will be delivered in English language. Also, the intervention module/lecture will be made concise and simple in order to enhance understanding of the intervention.

2.5 Data Analysis Plan

Data analysis in this study will be of 2 parts involving descriptive and inferential analyses. Descriptive analysis entails respondents' profile and demographic background of the respondents which will be presented by summing up the data and coming up with a myriad of tables. In this analysis, data are described by showing the frequency of occurrence of various outcomes (Alan, & Barbara, 2009). Inferential data analysis involves estimation of Chi-square, one-way multivariate analysis of variance, 2-way repeated measure multivariate analysis of variance, and MANCOVA and ANCOVA. The level of significance will be set at $\alpha=0.05$, and all testing of hypotheses will be conducted using 2-sided tailed hypotheses, and the statistical program to used is IBM SPSS version 25.

2.6 Ethics Approval and Registration

In order to conduct this study, the researcher will obtain the ethical approval from UPM ethical committee. A formal letter will be sent by the researcher to the ministry of health in Jordan and the hospitals included in this study. In addition, sampled nurses will sign the consent form.

EXPECTED RESULTS

It is primarily expected that the result of the current research will be no difference between control and intervention group in respect of nurses' performance and commitment before intervention, but there will be a statistical significant difference between intervention and control group after intervention. It is expected that the level of commitment and performance among the intervention group and control group will be low

in the baseline data, and such level of commitment and performance is expected to be statistically non-significant ($P > .05$) before intervention.

Moreover, it is expected that after implementation of the lecture in intervention hospitals, commitment and performance levels of the nurses will upsurge and statistically significant ($P < .05$), hoping that the intervention will be effective to inculcate organizational behaviors in the nurses in the intervention group. Nevertheless, commitment and performance levels of the nurses in the control group are expected to be indifferent and non-significant ($P > .05$) over time. In addition, it is expected that social demographic variables (gender, age, education, and years of experience) will have influence on the effectiveness of TQM implementation on nurse.

IMPLICATIONS AND LIMITATIONS

The current study adopts quasi-experimental research design with the aim to investigate the effect of intervention on nurses' level of commitment and performance. The reason being that enhancement of commitment of nurses is paramount to the accomplishment of overall performance of the hospital and effective health care system and enhanced nurse performance remains long standing determinant of quality service rendered for patients admitted to hospitals.

The findings of this research would show the ways to improve future healthcare quality improvement initiatives, add to the existing body of literature and contribute significantly to both theory and practice. Using the findings of this proposed study, it will be beneficial to both the nurses and hospitals, given the fact that implementation of TQM intervention, with the application of 5S- KAIZEN, will allow all the workers in the organization to carry out their tasks with the best of their ability to attain good quality. It gives room for effectiveness and efficiency because the application of sorting, setting, shinning, standardizing, sustaining, and continuous improvement are all tantamount to appreciable performance and commitment. It also helps to buffer the productivity of operation and abstain the organization from some cost that are connected with waste, which on the long run will provide more benefits to customers in values of service quality and price which will serve as satisfaction within them.

Overall, the finding of this research can be practically useful for hospital management, practitioners, and decision makers to enhance nurses' performance. In addition, this study can be taken as a model that can be followed by Hospital in Jordan or any other country, as it can serve as a base for creating certain rules and policies for the development, growth, excellence, and enhancement of performance in the healthcare organizations. Nevertheless, this proposed study is limited on the aspect of research design. Although the intervention and control group are similar and comparable, the internal validity, which could reduce the inference of causality due to the lack of randomization, may be threatened.

CONCLUSION

This research, which proposes to develop, implement, and evaluate the effect of CQI aspect of TQM intervention in enhancing the commitment and performance of nurses in the

government hospitals in Jordan, would make contributions in many ways including theoretical and managerial contributions. It theorizes that with TQM intervention the levels of commitment and performance of the nurses in the intervention group, as against the nurses in the control group, will upsurge and statistically significant ($P < .05$). Thus, this study contributes to the present body of knowledge, and it can equally be a useful guide for stakeholders and policy makers in Jordan and elsewhere.

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